

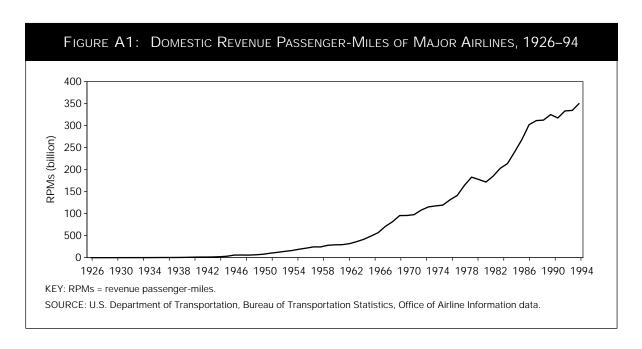
AN OVERVIEW OF THE U.S. COMMERCIAL AIRLINE INDUSTRY

Since its modest beginnings in the 1920s, the U.S. commercial airline industry has developed into a robust airline system noted for speedy, reliable, and safe movement of people and goods. The extent and density of its network, the level of passenger traffic, as measured by revenue passenger-miles (RPMs)¹ generated, are at historic highs (see figure A-1).

The U.S. commercial airline industry has grown dramatically since the end of World War II, with impressive gains occurring in the post-1979 era. For example, in 1945, U.S. trunk carriers²

flew 3.3 billion domestic RPMs; in 1979, 205 billion. By 1994, domestic RPMs for the majors had climbed to almost 352 billion. Moreover, the United States has more airports (18,343 in 1994) than the rest of the world combined. Of this number, over 400 are primary airports (with Federal Aviation Administration control towers), which account for more than 99 percent of all passenger enplanements on air carriers. (USDOT FAA 1995) In 1994, 515 million passengers boarded U.S. airlines, 42 percent of the 1.2 billion airline passengers in the world. In the same year, U.S. airlines produced 511 billion RPMs or 39 percent of the world's 1.3 trillion RPMs.

Between 1979 and 1994, growth of air passenger travel (domestic and international) in the United States kept pace with that of the world



¹ A revenue passenger is defined as one who has paid a fare, as distinct from a carrier employee who travels free. A revenue passenger-mile is defined as one passenger transported one mile.

² Trunk carriers provided service to major city markets. After passage of the Airline Deregulation Act of 1978, the formal definitions of carriers changed. Carriers that earn more than \$1 billion annually are now referred to as majors. See 14 CFR 121.

Table A1: U.S. Share of Total International and World Passenger Traffic and Revenue Passenger-Miles, 1979–94

	1979	1984	1989	1994
Total passengers				
World total passengers (millions)	755	841	1,117	1,225
U.S. total passengers (millions)	314	333	451	515
U.S. share of total world passenger traffic	42%	40%	40%	42%
International passengers				
World international passengers (millions)	159	184	263	343
U.S. international passengers (millions)	24	29	44	53
U.S. share of international passenger traffic	15%	16%	17%	15%
Total revenue passenger-miles (RPMs) ^a				
World total RPMs (billions)	659	789	1,110	1,300
U.S. total RPMs (billions)	262	298	431	512
U.S. share of total world RPMs	40%	38%	39%	39%
International revenue passenger-miles (RPMs) a				
World international RPMs (billions)	274	344	516	708
U.S. international RPMs (billions)	49	64	105	142
U.S. share of international RPMs	18%	18%	20%	20%

^a RPMs are converted from International Civil Aviation Organization (ICAO) revenue passenger-kilometers at 1 kilometer equal to 0.6214 miles. ICAO's RPMs for the United States used in this table are different from U.S. Department of Transportation's RPMs used throughout this appendix. ICAO RPMs are used in this table for comparison with ICAO's estimate of world RPMs, which are reported in kilometers.

SOURCE: International Civil Aviation Organization, Civil Aviation Statistics of the World (Montreal, Canada: 1980,1984,1989,1994).

(see table A-1). Total world passenger traffic grew by 62 percent from 1979 to 1994 compared with a 64 percent growth rate in the United States over the same period. The corresponding growth in RPMs for the world and the United States was 97 percent and 96 percent respectively.³

This appendix provides an overview of the U.S. commercial airline industry, focusing on the 1979 to 1994 period. It begins with a brief historical survey of the evolution of the nation's airline system and the federal government's role in facilitating the development of aviation technology and air transport industries, ensuring the safety and security of the system and its passengers, and reducing related environmental impacts. This discussion is followed by a brief review of airline industry deregulation and the domestic airline industry's response to a deregulated market. The appendix also examines trends in average airfares for the top 20 origin and destination (O&D) citypairs and the factors contributing to declining average airfares. Finally, it describes passenger and freight traffic growth and reviews the finan-

³ In 1994, there were 342.5 million international scheduled passengers in the world, of which the United States generated 52.7 million or 15 percent. In the same year, the United States produced 20 percent of all international passenger RPMs; the higher share in RPMs reflects the distance most passengers traverse over the Atlantic and Pacific Oceans. The growth rates in international passenger traffic in the last 15 years in the United States and the world were higher than total passenger traffic rates. International scheduled passenger traffic grew in that period by 116 percent; international RPMs rose 159 percent for the world and 189 percent for the United States.

In 1994, the most recent year for which data are available on world airline passenger and cargo operating revenues, the total world airline revenues were \$247.5 billion. The U.S. airlines generated 35 percent (\$87.4 billion) of this amount. Between 1989 and 1994, however, U.S. airlines operating revenues as a percent of the world total declined from 38.9 percent. (Aerospace Industries Association of America 1995; Aviation Week Group 1996; USDOT)

TABLE A2: COMMERCIAL PASSENGER AND FREIGHT AIRLINES IN THE UNITED STATES, NOVEMBER 1995

Majors (revenues over \$1 billion)	Nationals (revenues over \$100 million to \$1 billion)		Large regionals (revenues \$20 million to \$100 million)		
Passenger	Passenger		Passenger		
America West American Continental Delta Northwest Southwest Trans World United USAir	Air Wisconsin Alaska Aloha American International American Trans Air Arrow Air Atlantic Southeast Business Express Carnival Air Continental Express Continental Micronesia Evergreen International Hawaiian Air	Horizon Air Kiwi International Markair Mesa Airlines Midwest Express Reno Air Simmons Airlines Southern Air Sun Country Tower Air Trans States US Air Shuttle World Airways	Air South Air Transport International Amerijet International Atlas Air Buffalo Airways Executive Airline Express One Fine Airlines Florida West Frontier Airlines Kitty Hawk Airlines	MGM Grand Miami Air North American Reeve Aleutian Rich International Spirit Air Lines UFS, Inc. Valujet Airlines Western Pacific Zantop International	
Freight	Freight		Freight		
Federal Express United Parcel Service	DHL Airways Emery Worldwide		Challenge Air Cargo Northern Air Cargo	Polar Air Cargo	

NOTE: The carriers listed here represent 95.6 percent of total industry revenues, 95.4 percent of passenger revenues, 94.5 percent of operating profits, 99.4 percent of enplanements, and 99.6 percent of revenue passenger-miles.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information data, 1995.

cial performance of the nation's largest three air carrier groups: majors, nationals, and large regionals (see table A-2).

Domestic Commercial Aviation: Historical Overview

Commercial air transport is essential to American personal mobility, commerce, and national security. Per capita air travel has increased sharply, in terms of annual RPMs, doubling from 1,110 in 1980 to 1,990 miles in 1994. In addition, gross domestic product (GDP) originating in the air transport service sector more than doubled from \$19.2 billion in 1980 to \$44.8 billion in 1993 (in 1987 dollars), the latest year for which data are available. (USDOC BEA 1995, 47)

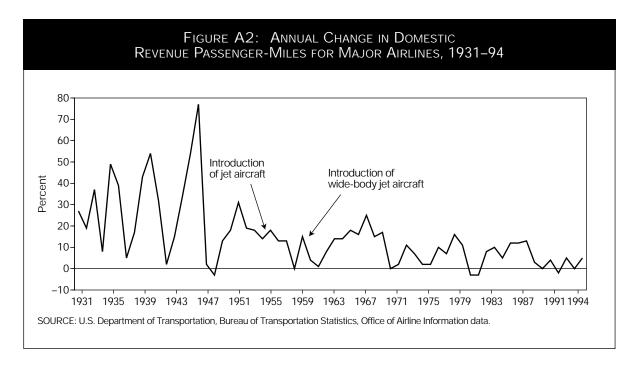
The evolution of the nation's airline system has been fundamentally influenced, directly and indirectly, by federal government involvement. Early in the nation's aviation history, U.S. Postal Service contracts provided the impetus for the development of aircraft and the establishment of routes to ensure the delivery of mail by air. Subsequently, federal research and development accelerated the pace of technological developments in communications and navigation equipment, aircraft engines, and the design and construction of airframes. Moreover, the availability of military transports after World War II provided the airline industry with inexpensive aircraft that could be adapted for cost-effective commercial service. During this period, aircraft manufacturers successfully made the peacetime transition from producing military aircraft to building commercial aircraft that incorporated advances in aircraft design and performance gained from military aviation programs. Also immediately following World War II, individual airlines with the support of the federal government began to expand their route systems throughout the United States.

The federal government began regulating the economic activities of the nation's airlines as early as 1938. In that year, Congress passed the Civil Aeronautics Act, which created the Civil Aeronautics Board (originally called the Civil Aeronautics Authority) to oversee economic regulation of airlines. The intent of this legislation was to ensure the adequate provision of air transport services. The Civil Aeronautics Act was superseded by the Federal Aviation Act of 1958, which established the Federal Aviation Administration (FAA) and continued economic regulation of airlines until deregulation in 1978.

The major features of economic regulation under the Federal Aviation Act were: 1) control of market entry by requiring new airlines to obtain a government certificate of public convenience and necessity to operate, 2) control of cargo rates and passenger fares, 3) provision for the payment of direct government subsidy to airlines, and 4) control of intercarrier relations such as mergers and agreements.

The primary reason for adopting a regulatory approach was to preclude unconstrained market entry. Some argued that the competition resulting from unconstrained market entry could adversely affect the industry's ability to attract capital for needed investment.

During the period of airline economic regulation (1938 to 1978), the quality and availability of airline service steadily improved, and the average price of air transport relative to all other goods and services declined. The industry provided an ever-widening and increasing quality of service, and enjoyed, predictably, an expanding market. Because of its reliability, speed, and convenience, the airline industry began dominating the intermediate and longdistance passenger travel market and eventually outpaced their modal competitors in long-haul markets. Figure A-2 shows historical changes in domestic RPMs for trunk carriers (prior to 1979) and major airlines. As shown in the figure, the largest growth spurt occurred immediately following the end of World War II. The introduction of jet aircraft in the late 1950s



and wide-body aircraft in the early 1960s spurred growth and increased productivity. Wide-body jets travel at greater speeds, which results in higher utilization rates and lower costs per passenger-mile.

Passenger travel continued to grow in the mid- to late 1970s as the economy expanded and personal income rose. Interest in investigating the potential benefits of less economic regulation of the airline industry gained an expanded audience during this time. The Civil Aeronautics Board (CAB) experimented with relaxed regulatory constraints by granting airlines more fare flexibility and permitting new and existing airlines to more easily enter and exit new markets.

As early as the 1950s, economists were critical of airline regulations based on their appraisal of the industry and the implications of constrained market entry on prices and services. (Meyer et al 1959; Caves 1962; Levine 1965) Economists speculated that cessation of CAB market entry and fare regulation would increase competition on the most heavily traveled routes, resulting in market-driven decisions on fares and quality of service. Their speculations were based on comparisons of the regulated CAB market with intrastate markets in California and Texas, which were not regulated by CAB. (Levine 1965) Intrastate markets in California were regulated by the Public Utilities Commission, which allowed unconstrained market entry for airlines. (TRB 1991)

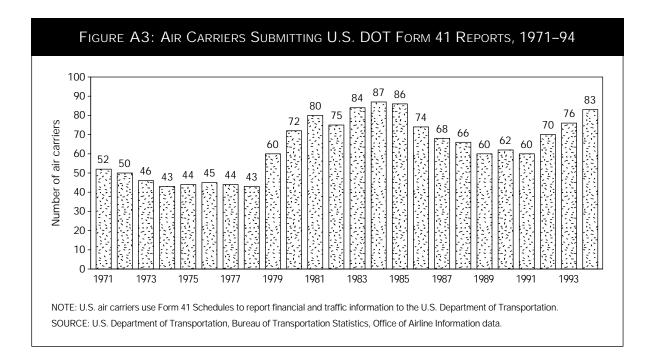
These criticisms, coupled with growing public disillusionment with the effects of economic regulation in the trucking and railroad industry, culminated in the Airline Deregulation Act of 1978. (USCAB 1975, 6-7) Under this legislation, businesses that met fitness requirements were free to enter and exit domestic air transport markets at will and set fares in response to market demand.

At the heart of the question was the expected performance and potential competitiveness of a deregulated industry. Increasingly, arguments were advanced that competition would produce greater efficiencies, a wider variety of services, and lower fares. Because of the relatively low costs of entry and exit and the high mobility of capital, some economists suggested that any airline trying to levy monopoly prices would be quickly contested by new airlines entering the market to offer services at a lower cost. According to this contestability theory, the threat of entry would have the same price-moderating effect as actual entry. (Bailey and Baumol 1984, and Baumol et al 1982) This theory was partially responsible for the way in which deregulation occurred and the relative ease under which airline industry mergers were approved. Subsequent research conducted throughout the 1980s (Bailey et al 1985, Hurdle et al 1989) showed that the theory was not applicable to all airline routes and that the ease or threat of entry will not necessarily restrain prices. In spite of the fact that many city-pair markets are not contestable, deregulation significantly impacted airfares (see below).

The Post Deregulation Period: 1979 to 1995

The 1978 Airline Deregulation Act altered significantly the environment in which airlines operate. The advent of airline deregulation ushered in an era of fierce competition with the arrival of new entrants, some of whom were former intrastate carriers, local service providers, and charter operators. Discount fares multiplied, price wars ensued, and overall traffic soared absolutely and relative to population. Today, average passenger fares (when adjusted for inflation) are lower in most markets and flight frequency is greater.

Shortly after deregulation, the number of new service providers jumped sharply (see figure A-3). New entrants made serious inroads into



market shares of trunk lines,4 and the share of total traffic accounted for by the largest carriers fell from 94 percent to 77 percent between 1978 and 1985. (TRB 1991) To counter competition, major airlines used a variety of strategies that effectively raised the cost of market entry for new and smaller airlines and developed economies of scope that affected consumer choices in favor of major established airlines. (Economies of scope result when airlines offer a wider variety of services while allocating overhead costs over an increasing number of services.) The most common strategies included building extensive hub-and-spoke route systems and developing marketing programs that would increase carrier loyalty and expand carrier services, such as computer reservation systems (CRSs), frequent flyer programs, and codesharing with commuter airlines.

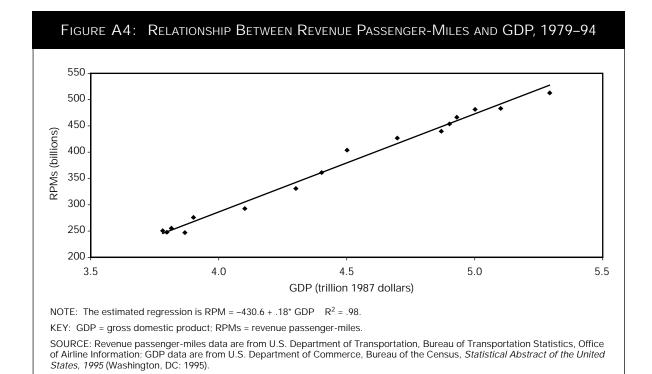
Airlines' efforts to mitigate some of the negative effects of deregulation were complicated by some long-term secular trends in the economy and special events occurring at the same time. Among the latter were the 1979–80 Organization of Petroleum Exporting Countries (OPEC) petroleum price increases, which led to operating cost increases, and subsequently a fall in air transport demand. Another disruptive event was the operating constraints imposed by the air traffic controller strike in 1981.

Ultimately, most new entrants, as well as some older established airlines, failed to survive in this new, highly competitive environment. Because of the shrinking number of carriers, the market shares of the three largest airline groups (majors, nationals, and large regionals) have increased. In 1994, the major, nationals, and large regional carriers accounted for 99.4 percent of total passenger traffic (see table A-2).

Traffic Growth

The demand for airline service is income elastic and appears to be price elastic. As real income rises, passengers spend more money on air travel. Conversely, as fares rise, passengers

⁴ A trunk line is an air carrier's main route, usually between two major airports.



spend less on air travel. Both business and tourist travel are price elastic but the tourist market is far more so, explaining why many discount fares target tourists.

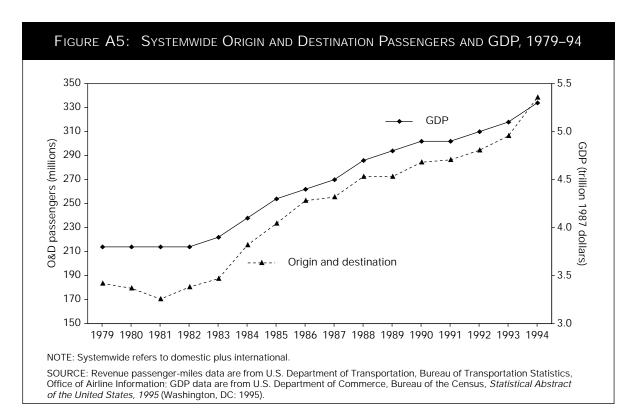
Air traffic growth mirrors trends in the national economy. Figure A-4 shows the close statistical relationship between RPMs and inflation-adjusted GDP from 1979 to 1994. From 1979 to 1994, the number of enplaned passengers grew by 3.6 percent annually. Also, the trend in O&D passenger traffic continued upward, closely paralleling the growth in inflation-adjusted GDP⁵ (see figure A-5).

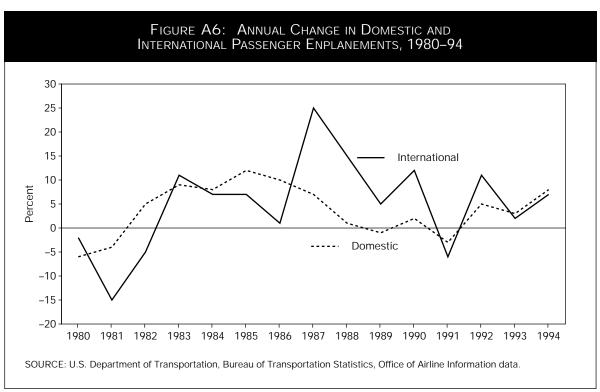
Traffic growth has not been uniform for all categories of carriers in the industry: major airlines have enjoyed substantial growth since 1979 (an 89 percent increase in enplanements); national air carrier growth has remained flat; and the large regionals have experienced phenomenal growth—in excess of 500 percent. (USDOT OAI) Continued growth of large regional carriers is dependent, in large part, on their marketing partnerships with major airlines. Regional carriers provide service to markets that could not be economically served by major airlines operating larger aircraft. The nature of service in smaller markets that provide feed traffic to larger hubs is short-haul, nonstop service.

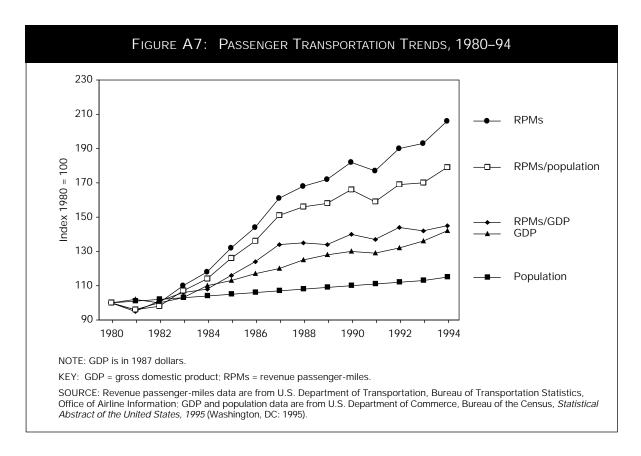
Despite market entry limitations imposed by foreign governments, U.S. airlines experienced growth in international markets (see figure A-6). Between 1987 and 1993, the number of passengers traveling on U.S. airlines between the United States and foreign destinations increased by 47 percent, while domestic traffic increased by only 6 percent. (USGAO 1995, 2)

As shown in figure A-7 and table A-3, RPMs increased sharply, by about 105 percent between 1980 and 1994. During this period, the U.S. pop-

⁵ The effect of the economy on airline traffic is reflected in two direct measures of traffic growth: enplaned passengers (the total number of passengers boarding aircraft for one-stop and multiple-stop flights) and O&D passengers (the number of passengers flying from an intended origin to an intended destination); both increased substantially between 1979 and 1995. O&D count is a better measure of actual passenger traffic because it eliminates double counting, which is inherent in passenger enplanement numbers.







ulation grew by only 14.5 percent. Hence, there was an increase in personal travel by air; the number of enplanements per capita increased by 55 percent (see figure A-8). Also the average length of the air trip increased from 854 miles to 985 miles. (USDOT OAI) The rapid growth in demand for air service as the preferred mode for intermediate and long-distance travel can be attributed to its speed, declining cost (in inflation-adjusted terms), and convenience. Between 1980 and 1994, RPMs per unit of GDP increased. This shows the increasing contribution of air travel to GDP (see table A-3).

Air freight transportation trends parallel those in the passenger sector (see figure A-9 and table A-4). Because of structural shifts in the economy, such as the shift away from materialintensive to knowledge-intensive production (dematerialization), the freight and express package business has been a growth industry in

recent years. As shown in figure A-9, revenue ton-miles per GDP increased over the 1980 to 1994 period. Again, this trend shows the shift in the economy toward higher value per unit weight production.

Competitive Airfares

Are air passengers paying lower fares today than they did in 1980? The answer is yes. Figure A-10 shows that yields declined between 1980 and 1994. During this period, airline passengers paid less (in inflation-adjusted terms) for air travel.⁶ Several factors influenced the trend in average airfares. The most significant of these

⁶ Yield per mile is calculated by dividing passenger revenues by revenue passenger-miles

TABLE A3: PASSENGER
TRANSPORTATION TRENDS, 1980–94

Population Year (millions)		GDP (billion 1987 dollars)	Revenue passenger- miles (RPMs) per capita	RPMs per thousand 1987 dollars of GDP	
1980	227	3,776	1,110	67	
1981	229	3,843	1,062	63	
1982	232	3,760	1,238	67	
1983	234	3,907	1,184	71	
1984	236	4,149	1,266	72	
1985	238	4,280	1,396	77	
1986	240	4,405	1,515	82	
1987	242	4,540	1,675	89	
1988	244	4,719	1,738	90	
1989	247	4,838	1,761	89	
1990	249	4,897	1,845	93	
1991	252	4,868	1,774	91	
1992	255	4,979	1,883	96	
1993	258	5,135	1,895	95	
1994	260	5,344	1,994	97	

NOTE: GDP = gross domestic product.

SOURCE: Revenue passenger-miles data are from U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information; GDP and population data are from U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States*, 1995 (Washington, DC: 1995).

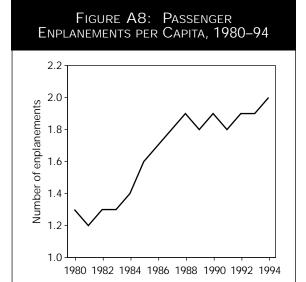
are energy and other operating costs, airline dominance on a route, and national economic trends. Other less influential but important factors are airport limitations on take-offs and landings, level of airport congestion, codesharing agreements, market share of route traffic and share of gates on a route, the use of CRSs, operating costs of the least-cost airline on a route, and price sensitivity of passengers (business versus leisure).

Historically, technological advances also have had an impact on airfares. For example, advances in aircraft design, materials, and construction, aircraft engines, and operating procedures increased productivity per dollar spent on aircraft in the 1980s. (Meyer and Oster 1987, Gordon 1990) Increases in productivity led to reductions in per-seat-mile costs and permitted reductions in airfares.

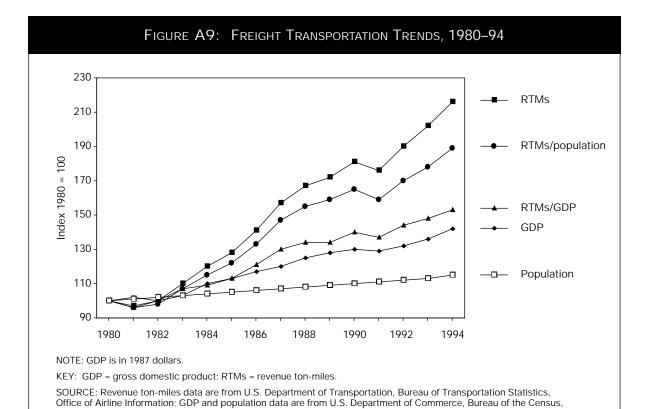
Shortly after deregulation of the airline industry in 1978, energy costs rose to record-setting levels as a result of the 1979–80 oil crisis. Not surprisingly, fuel is a critical and large expenditure of the airline industry and thus has a significant impact on fares. As shown in figure A-10, real yields rose dramatically, partly in response to increases in total operating costs, and then declined steadily after 1981 as energy prices stabilized and the economy recovered from a recession.

During the 1980s, new carriers entered markets at the same time existing airlines were attempting to expand their market shares. In the early 1980s, established airlines were forced to compete with low-cost carriers for a limited pool of travelers by offering reduced fares.

The development of the hub-and-spoke route structure also had an impact on airfares. This structure offered airlines economies of scale such as centralized operational facilities, flexi-



SOURCE: Passenger enplanement data are from U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information; population data are from U.S. Department of Commerce Bureau of the Census, Statistical Abstract of the United States, 1995 (Washington, DC: 1995).



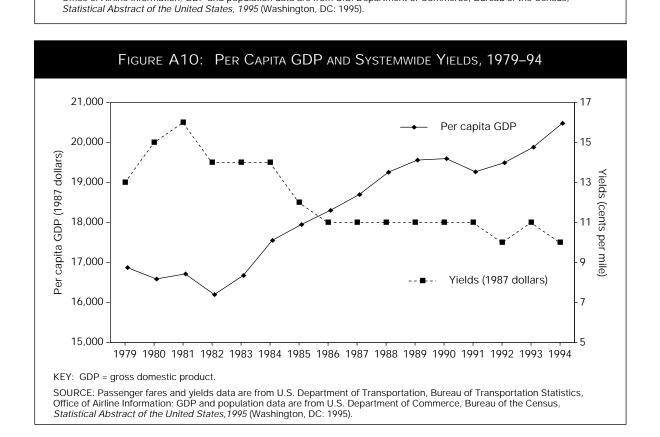


Table A4	: FREIG	HT
TRANSPORTATION	TRENDS,	1980-94

Year	Total RTMs (billions)	RTMs per capita	RTMs per thousand 1987 dollars of GDP
1980	32.1	141.4	8.5
1981	31.2	136.2	8.1
1982	32.0	138.3	8.5
1983	35.4	151.4	9.1
1984	38.4	162.9	9.3
1985	41.1	172.9	9.6
1986	45.2	188.3	10.3
1987	50.4	207.8	11.1
1988	53.6	219.3	11.4
1989	55.3	224.2	11.4
1990	58.2	233.4	11.9
1991	56.5	224.2	11.6
1992	61.2	239.9	12.3
1993	64.7	251.2	12.6
1994	69.5	267.0	13.0

KEY: RTMs = revenue ton-miles; GDP = gross domestic product.

SOURCE: Revenue ton-miles data are from U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information; GDP and population data are from U.S. Bureau of the Census, Statistical Abstract of the United States, 1995 (Washington, DC: 1995).

bility in route patterns, increases in frequency of service, and the ability to serve more points and people with a given fleet of aircraft. As new hubs developed and competition among hubs proliferated, fares were reduced further.

The health of the national economy is a major factor influencing airfares. During the second half of the 1980s, the economy grew as did demand for air transport. Airline costs, however, rose faster than inflation, thus increasing fares. By the late 1980s, new airlines had either failed or merged with surviving carriers. Consolidation among the carriers did not result in fare increases because fewer airlines served more city-pair markets and overlapped other

carriers service areas. The net result of these factors was that competition among hubs rose and, consequently, average real yields declined rapidly between 1981 and 1986, did not recover, and in 1994 were slightly below their 1986 level (see figure A-10).

Overall, competitive airline pricing brought about by deregulation and other factors lowered fares on many routes for air travelers. Using total third quarter O&D passenger information for the top 20 domestic city-pair markets, average fares declined by 31 percent, from \$128 in 1979 to \$88 in 1994 (see table A-5). The decline in average fares occurred in spite of pressure to increase fares from energy price hikes and other operating cost increases, reflecting the intense price competition on many routes.

By 1994, more than 75 percent of passengers traveled in markets that had inflation-adjusted fare reductions. Travelers in some short-distance markets dominated by low-cost airlines enjoyed drastically reduced promotional fares. Indeed, today almost 40 percent of domestic passengers travel in markets where low-cost carriers compete. As shown in table A-5, however, three of the top 20 O&D city-pairs (Los Angeles-San Francisco, Boston-New York, and New York-Washington, DC) experienced increased inflation-adjusted fares. Historically, passengers flying longer distance have enjoyed greater fare reductions than those in medium- and short-distance markets.

Hub-and-Spoke Pattern

In the early 1980s, major carriers changed their route structures from a linear point-to-point network, in which airplanes flew through a series of points collecting passengers along the route to a hub-and-spoke network. The advantage of the hub-and-spoke network is that it permits airlines to serve many points without having all points directly interconnected. The

Table A5: Passengers and Fares for the Top 20 Domestic Origin and Destination Markets, Third Quarter Period, 1979–95

Total quarterly O&D passengers and fares (1987 dollars) ordered by percentage change in fares

From	То	1979	1982	1986	1990	1994	1995	Change in fares 1979–9
Los Angeles	Phoenix	80,000 \$140.46	118,620 \$66.83	354,140 \$34.06	356,070 \$36.19	333,260 \$37.27	307,550 \$39.89	-72%
Honolulu	Los Angeles	114,920 \$367.94	288,990 \$118.14	232,940 \$170.28	308,250 \$116.50	222,840 \$133.23	274,950 \$127.49	-65%
Los Angeles	Oakland ^a	360 \$97.71	137,950 \$57.28	127,680 \$80.50	120,540 \$58.25	309,140 \$43.62	410,850 \$40.67	-58%
New York	San Juan	323,970 \$196.95	382,580 \$142.00	412,220 \$124.87	330,000 \$136.80	318,350 \$119.75	308,690 \$121.24	-38%
New York	Palm Beach	74,800 \$152.67	178,200 \$121.72	186,610 \$115.58	244,360 \$97.97	253,550 \$82.47	202,090 \$100.90	-34%
₋as Vegas	Los Angeles	153,870 \$58.02	168,180 \$65.63	264,580 \$55.73	148,620 \$74.14	424,740 \$42.82	440,990 \$41.45	-29%
Vliami	New York	372,950 \$137.40	316,020 \$152.74	377,910 \$121.78	433,750 \$100.62	483,140 \$88.03	423,050 \$100.90	-27%
Chicago	Detroit	141,600 \$73.28	149,470 \$91.89	204,780 \$91.85	400,230 \$41.48	347,530 \$54.72	355,290 \$56.32	-23%
Dallas	Houston	91,550 \$64.12	645,820 \$34.61	459,640 \$47.47	535,330 \$45.90	532,320 \$48.37	510,880 \$50.84	-21%
Ft. Lauderdale	New York	336,610 \$131.30	271,390 \$142.00	334,630 \$115.58	383,220 \$96.20	413,940 \$83.27	300,550 \$104.81	-20%
Honolulu	Lihue, Kauai, HI	218,870 \$35.11	162,060 \$20.29	143,300 \$36.12	431,880 \$28.24	428,400 \$30.93	510,250 \$28.94	-18%
Chicago	New York	487,160 \$140.46	506,370 \$188.54	620,790 \$149.64	534,500 \$195.94	716,020 \$95.96	701,390 \$116.54	-17%
Honolulu	Kahului, Maui	184,660 \$33.59	209,480 \$17.90	207,800 \$37.15	534,810 \$28.24	712,370 \$30.13	743,660 \$28.16	-16%
Los Angeles	New York	603,700 \$210.69	582,110 \$255.37	644,440 \$204.33	660,240 \$214.47	579,670 \$181.60	566,830 \$180.68	-14%
New York	San Francisco	371,110 \$224.43	359,730 \$261.34	424,000 \$201.24	410,920 \$215.36	383,090 \$200.63	422,970 \$193.98	-14%
New York	Orlando	196,720 \$114.50	177,830 \$133.65	339,660 \$101.14	496,630 \$86.50	456,210 \$84.85	362,160 \$100.90	-12%
Atlanta	New York	195,610 \$145.04	200,080 \$171.84	336,940 \$130.03	296,450 \$173.87	411,580 \$112.61	381,660 \$142.35	-2%
os Angeles	San Francisco	324,340 \$42.75	471,050 \$57.28	506,850 \$74.30	518,520 \$58.25	410,770 \$58.68	380,230 \$57.88	35%
Boston	New York	503,490 \$65.65	697,370 \$59.67	763,280 \$58.82	614,890 \$92.67	576,330 \$77.72	566,680 \$80.56	23%
New York	Washington, DC	495,370 \$70.23	503,110 \$68.02	620,910 \$60.89	571,920 \$94.44	460,980 \$83.27	460,490 \$80.56	15%
Total passeng Average fare	ers	5,271,660 \$128.09	6,526,410 \$117.23	7,563,100 \$105.36	8,331,130 \$102.68	8,774,230 \$83.48	8,631,210 \$87.81	-31%

^aDirect airline service from Los Angeles to Oakland, California started in the 1970s.

SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, airline origin and destination data.

hub-and-spoke system also obviates the need to change airlines, thereby reducing the possibility of losing baggage.

Airlines have a strong incentive to increase their control at their connecting hubs. This has encouraged geographic expansion and resulted in intensified service competition in many citypair markets.

Although major carriers tend to dominate at the largest hubs, consumer choices have increased significantly since deregulation. More city-pair markets and passengers enjoy competitive service from competing carriers than ever before.

Innovative Marketing Strategies

The advent of deregulation forced airline management to develop new approaches for marketing air transportation. Several strategies emerged: sophisticated discounting practices, marketing arrangements with travel agents relying on computer reservations systems, incentive commission programs, frequent-flyer programs, and close operating agreements with smaller air carriers.

Discount airfares were used to counter lowfare offerings of new, low-cost, often non-union, carriers. Over time, established carriers developed yield management systems in conjunction with CRSs, permitting air carriers to focus on selling, at a discount, seats that would have gone unsold. Airlines use computer-based yield management systems to efficiently market discount fares to different customers such as tourists and business-class and first-class passengers. Yield management systems permit the airline industry to take advantage of the different price sensitivities among classes of passengers so that each flight may have a mix of full-fare, partially discounted, and fully discounted tickets. Furthermore, CRSs permit carriers to target competitors' seat availability with minimum impact on prices for their own seats.

In recent years, the airlines elevated the importance of travel agents, a major distribution channel for tickets. American Airlines and United Airlines pioneered the use of CRSs that enabled travel agents to track frequent changes in service and fares and to reserve flights. Economic incentives were provided to travel agents who reserved flights on CRS carriers even though other carriers were available. Eventually, these two airlines claimed affiliations with nearly 80 percent of automated travel agencies. Travel agents are given further incentives to reserve a seat with a particular airline through the provision of high booking fees called commission overrides, which are given for achieving specific volumes in ticket sales.

Frequent-flyer programs aimed at promoting carrier loyalty proved to be a powerful marketing tool. Introduced in 1981 by American Airlines, frequent-flyer incentives spread throughout the industry as an important way to retain business travelers who are less able to take advantage of deep discount fares, but who might opt for lower fares offered by competitors. The importance of offering frequent-flyer benefits is heightened by the fact that roughly 5 to 6 percent of passengers account for approximately 40 percent of all trips. (TRB 1991, 55)

Frequent-flyer programs have been criticized for a variety of reasons. Some have argued that the airlines pay the cost of frequent-flyer programs by charging higher fares to all passengers. Another criticism is that frequent-flyer programs lessen the competitive pressure of deregulation; passengers may reject the lowest fare airline for a frequent-flyer plan in order to get points toward a future free flight.

Marketing affiliations, known as codesharing, were originally initiated between large and small carriers. These alliances have proliferated throughout the domestic industry and spread to the international arena (e.g., USAir-British Airways, 1993; Delta-Swissair, 1993; Northwest-KLM, 1993; United-Lufthansa, 1994; American-

Canadian Airlines International, 1995; United-Air Canada, 1995). These arrangements have developed into a succession of relationships, from intercarrier agreements to joint operations to partial ownership in some cases. Codesharing allows airlines to sell tickets and provide service to points beyond their immediate route network.

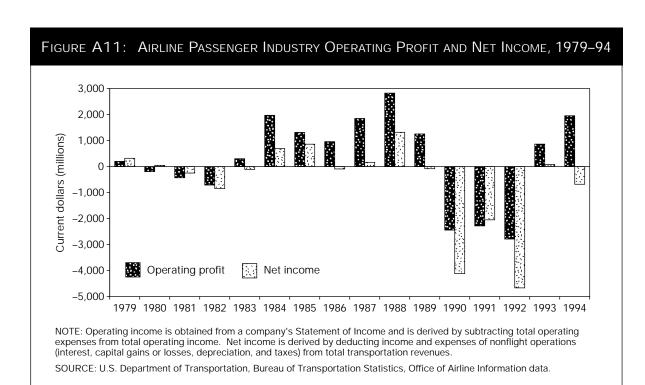
Industry Financial Performance

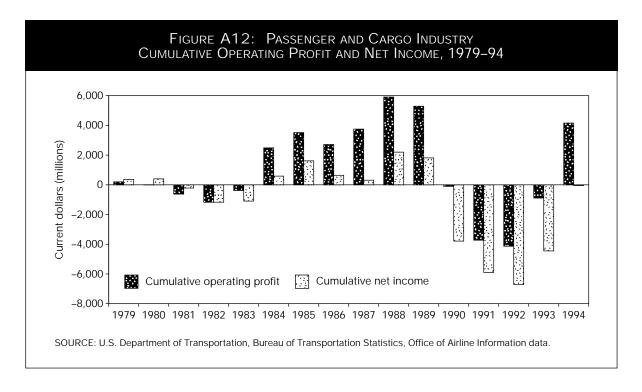
The strength of the industry's financial condition determines its ability to withstand periods of recession and attract enough capital to replace and expand its fleets. Its financial condition also affects its ability to comply with environmental and energy standards. To date, the airline industry's financial performance has been mixed.

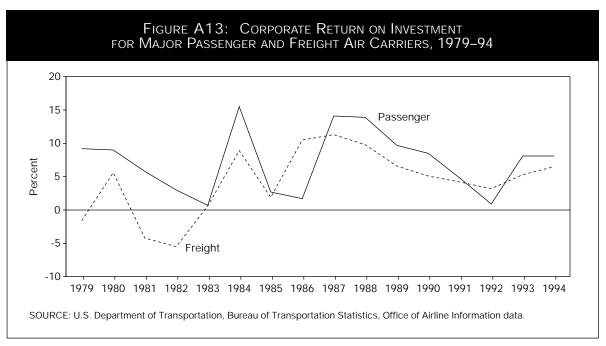
Figure A-11 shows the airline passenger industry's operating profit and net income from

1979 to 1994 for the nation's three largest air carrier groups. Between 1990 and 1992, the airline passenger industry recorded its highest losses in history, but has since rebounded. Similarly, the financial condition of the cargo industry has improved. Figure A-12 shows the passenger and cargo industries' combined cumulative operating profits⁷ and net income from 1979 to 1994. As shown in the figure, cumulative operating profits were \$16.9 billion, and cumulative net losses were \$15.4 billion. These results stemmed from sporadic profitability from 1979 through 1992, which can be traced to cycles in the national economy driving demand for air travel, the inability to maintain yields in the face of competition, and periods of excess seat capacity. By 1994, industry growth and stable yields resulted in the improved financial performance of most carriers. The rebound can be attributed

⁷Cumulative operating profits and net losses are obtained by summing the annual change in operating profits and losses.





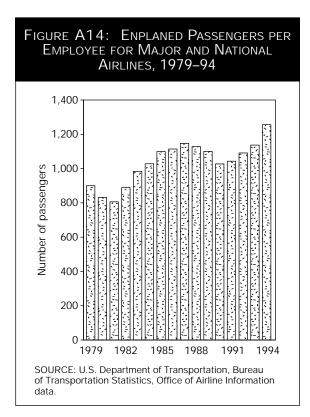


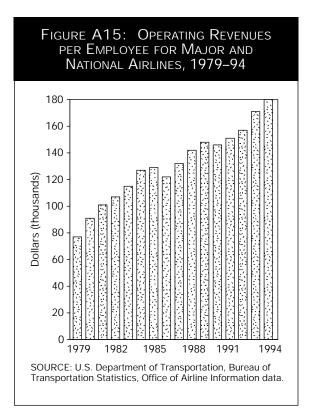
to robust growth in traffic, minimal overall capacity expansion, and better management of the full-fare passenger segment.

Since 1979, industry load factors averaged between 58 and 67 percent. After a sharp drop between 1979 and 1980, load factors rose and reached 66 percent by 1994. As a consequence of these factors corporate return on investment remained unstable for both the passenger and freight sectors of the industry (see figure A-13).

Labor Performance

Airlines are using fewer employees to provide services to a growing number of passengers and volume of freight activity. Between 1980 and 1994, total enplanements increased by about 78 percent, but airline employment grew by only 18 percent. Thus, the ratio of enplaned passengers





per employee rose by 51 percent over this period (see figure A-14). This striking increase in output per employee arises, in part, from the use of larger and faster aircraft, the computerization of passenger reservations, the hub-and-spoke structure, changes in work rules and practices, and changes in flight personnel requirements. Various yield management techniques adopted by the airlines after deregulation also may have improved labor productivity. Also during the period, operating revenues per employee significantly increased (see figure A-15).

Fuel Efficiency

The airline industry is a major consumer of jet fuel and to a lesser extent aviation gasoline. Between 1979 and 1994, airline fuel efficiency greatly improved. Although total jet fuel use increased, the available seat-miles per gallon—a measure of fuel efficiency—increased from 38 to 52; a 38 percent increase in fuel efficiency. Also, available ton-miles per gallon increased by 38 percent from 5.3 to 7.3. The reduction in fuel usage per unit of output arises from more efficient engines and operating procedures. Perhaps as important, less fuel consumption per unit of output translates into lower environmental impacts.

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